

EXHIBIT 3

In The Matter Of:

*THE CITY OF NEW YORK, v.
EXXON MOBIL CORPORATION*

August 17, 2009

*TRIAL
SOUTHERN DISTRICT REPORTERS
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NEW YORK., NY 10007
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Page 1532

[1] silt and clay. How do these different materials affect the
[2] movement of plumes of MTBE in groundwater?
[3] A. Well, aquifer systems like this one -- and we have studied
[4] many like this one. You know, it's kind of like doing
[5] comparative anatomy. We study other humans to learn about the
[6] medical science of individuals, and we apply that in medical
[7] science. But in all systems like this one you tend to have
[8] gravel, sand, silt and clay. Sometimes it's mixed up, and
[9] usually it also occurs in separate pockets. The effects of
[10] that are to make the rate at which groundwater moves, or the
[11] speed of groundwater in the system, to vary quite a bit
[12] locally.

[13] I mentioned last Friday that you could have
[14] groundwater moving at a speed of inches per year in one part of
[15] the system and just a few feet away or inches away have
[16] groundwater moving at a rate of thousands of feet per year, so
[17] that's because of these different materials.

[18] Q. And what effect do these different speeds of groundwater
[19] have on the spreading of a contaminant like MTBE in an aquifer?

[20] A. The effect is that the contaminant spreads out more because
[21] you have parts of a contaminant moving slowly and parts moving
[22] much more rapidly. It also results in the contaminant being
[23] difficult to clean up. So, there is the basic kind of a mantra
[24] of life that like a lot of things in life it's easier to get in
[25] than it is to get out. Well, that's true of groundwater

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(3) Page 1532 - Page 1535

Page 1534

[1] the rain event all the water has to drain out of the watershed
[2] through the various parts of the river or the stream network.

[3] In groundwater, it's like that, but on a completely
[4] different time scale. So the contaminant rises up, peaks
[5] relatively quickly, a time period of days, weeks, decades, and
[6] then the concentration declines over a much longer time period
[7] of say years, decades, centuries, depending on the context of
[8] the system.

[9] Q. And do you have a short three-minute video which shows this
[10] effect in a model?

[11] A. Yes.

[12] Q. Before we view this video, where did it come from?

[13] A. This is an instructional video that I use every year in my
[14] classes at UC Davis, and it was produced by Batelle Pacific
[15] Northwest lab, which is a scientific think tank in Washington
[16] State.

[17] Q. How does the aquifer modeled in this video compare to
[18] Brooklyn/Queens aquifer?

[19] A. The very same kinds of things that you see in this movie
[20] occur in the Brooklyn/Queens aquifer and virtually every other
[21] sandy gravelly type of aquifer system like this one.

[22] Q. And so does this video fairly depict the effect of
[23] different groundwater speeds in the Brooklyn/Queens aquifer?

[24] A. Well, it's much faster. What you are going to see -- for
[25] us to witness what we would see in the video we would have to

Page 1533

Page 1535

[1] contamination everywhere. We know that in every case where
[2] groundwater contamination occurs it's a lot harder to get the
[3] contaminant out than it is for the contaminant to get into the
[4] system.

[5] Q. And what effect do these different groundwater speeds have
[6] on how long a contamination problem with MTBE will persist?

[7] A. Well, that, together with the size of groundwater
[8] systems -- because they are big. You know, bear in mind that
[9] Long Island is bigger than most lakes, but putting that aside,
[10] these different materials make it such that the contaminants
[11] persist for longer and decades to centuries longer in the
[12] system because you have significant amounts of slow-moving
[13] groundwater, even in areas where you have fast-moving
[14] groundwater that would be considered aquifers.

[15] Q. And how does this affect the concentrations of MTBE over
[16] time at a high volume well like a public supply well?

[17] A. Basically what we observe is that when a contaminant comes
[18] through at a well, or arrives at a well, typically what happens
[19] is the concentration goes up pretty quickly to maximum levels,
[20] and by quickly I mean over a period of years to decades.
[21] Sometimes it's days. It depends on the scale of the system and
[22] what's happening. So, usually you get a rapid rise or a rapid
[23] peak. Kind of like when a river goes into flood, the river
[24] stage peaks relatively quickly, and then over time it takes a
[25] much longer time for the stage of the river to go down. After

[1] sit here for decades. So, it's obviously greatly sped up. But
[2] the differences in the rates of movement of the groundwater
[3] that are illustrated in the video are typical of what you would
[4] see in a system, but the video is even much simpler than what
[5] occurs in nature. So, it's an instructional video, but it's
[6] very fast, and it's not quite as variable as reality.

[7] Q. But it will help us understand how this works?

[8] A. Yes.

[9] MR. STEIN: If we could play the video.

[10] MR. STACK: Your Honor, I might be confused -- maybe
[11] the jury understands -- but are we looking at the movement of
[12] water or contamination? And if it's contamination, what
[13] contaminant?

[14] THE COURT: Do you understand his question?

[15] THE WITNESS: Yes.

[16] THE COURT: You may answer.

[17] THE WITNESS: The video shows the movement of a
[18] contaminant that is moving with the water, so it applies to
[19] MTBE in the absence of biodegradation or sticking to the soil,
[20] for example. It applies to many, many groundwater
[21] contaminants, MTBE among them.

[22] THE COURT: So, it could be really any contaminant
[23] that's not biodegrading.

[24] THE WITNESS: That's right.

[25] THE COURT: So a generic contaminant.

August 17, 2009

Page 1560

[1] **MR. STACK:** Objection, your Honor. Which area are we
[2] talking about?

[3] **THE COURT:** In the area of Station 6, right?

[4] **MR. STEIN:** Yes, your Honor. The area of Station 6 in
[5] the geographic area of Queens County depicted on the maps.
[6] **A.** If the wells are pumping, then MTBE plumes that are in the
[7] zone that contributes water to the well, then they'll be pulled
[8] towards the well.

[9] **Q.** When the wells are pumping, would you expect MTBE plumes to
[10] migrate down into the bay to discharge into the ocean?

[11] **A.** Not if the plumes are up in this region here, no.

[12] **Q.** And so how -- at some point those MTBE plumes will
[13] disappear, correct?

[14] **A.** Could you clarify?

[15] **Q.** How are those MTBE plumes going to get out of the water
[16] when all those public supply wells are on?

[17] **A.** Well, at that point, the main exit for the plumes would be
[18] the wells.

[19] **THE COURT:** And what does that mean?

[20] **THE WITNESS:** That means when the wells are pumping
[21] and drawing the plumes towards them, there's really no other
[22] exit or a point or a mechanism for the groundwater to get out.
[23] Essentially it's all, with this condition here in that region
[24] that's depicted, all the groundwater is flowing towards the
[25] wells.

Page 1561

[1] **THE COURT:** So it would be sucked up into the well,
[2] come out when the water is drawn from the well?

[3] **THE WITNESS:** That's right. It's only a matter of
[4] time.

[5] **Q.** You've heard about recharge before. What is recharge?

[6] **A.** Recharge is water usually from precipitation that gets into
[7] an aquifer and replenishes the aquifer. So that's why,
[8] recharge sustains aquifers. If you cut off recharge, like if
[9] you're in the outer common desert with almost no rainfall,
[10] there's almost no recharge there.

[11] **Q.** Would recharge cause the rain to move towards this area
[12] when the wells are pumping?

[13] **A.** No. Basically, the map you see here is reflecting the
[14] groundwater system and it's also reflecting the effects of
[15] recharge. If there were no recharge, this hole here, this
[16] decline in water levels would be even greater.

[17] **MR. STEIN:** If we could take the slide down, please?

[18] **Q.** Dr. Fogg, what is your opinion of how long plumes of MTBE
[19] will persist in the Brooklyn/Queens aquifer?

[20] **A.** My opinion is that, as I said Friday, it's at least
[21] decades, and based on my experience looking at groundwater
[22] systems like this all over the world over the past 34 years, I
[23] know of no groundwater contaminant that moves like MTBE and
[24] resists biodegradation like MTBE that has gotten into
[25] groundwater systems that is not still present at least 40 years

Page 1561

Page 1562

[1] later. We have a lot of examples from other chemicals that
[2] were introduced in the '40's and '50's. I don't know of a
[3] single case -- let me qualify that with one more thing -- for a
[4] single case of chemicals like this getting into any groundwater
[5] system and the chemicals are not being remediated, remediated
[6] meaning we're trying to do things at every place we know the
[7] chemical is to get it out of the ground and we're getting it
[8] out of the ground, I don't know of any case where those
[9] chemicals have just disappeared on a time period of 40 years.
[10] So this system, there's nothing different about it that would
[11] make it an exception to that type of rule or observation. So I
[12] would say that it's most likely that the MTBE will be around
[13] and measurable at problematic levels for at least 40-odd years
[14] since the ban of MTBE.

[15] **MR. STEIN:** No further questions, your Honor. Thank
[16] you, Dr. Fogg.

[17] **THE COURT:** All right, thank you, Mr. Stein.

[18] **MR. STACK:** Your Honor, I'm going to provide a copy of
[19] the binder for cross-examination with the caveat that we most
[20] likely will not go through all of these.

[21] **CROSS-EXAMINATION**

[22] **BY MR. STACK:**

[23] **Q.** Good morning, Dr. Fogg. How are you today?

[24] **A.** Fine, sir. How are you?

[25] **Q.** Good. With respect to the topics you covered this morning,

Page 1563

[1] I'd like to touch on quickly a couple issues and then we'll
[2] turn to some other subjects. First and foremost, in the past
[3] 15 years has your opinion regarding the biodegradation of MTBE
[4] changed?

[5] **A.** Yes.

[6] **Q.** 15 years ago you didn't think it biodegraded under any
[7] circumstances, am I correct?

[8] **A.** The literature, my interpretation of what would happen was
[9] a reflection of the literature at that time, and the literature
[10] at that time showed that there was very, very precious evidence
[11] of biodegradation. Actually, you could say the same thing
[12] about the current literature. But there was even less
[13] evidence, say, 15 years ago.

[14] **Q.** And the current literature -- if you wish to refer at any
[15] time to any of the articles that you cited in your report,
[16] that's why I gave you the binder, among other things.

[17] **A.** Thank you.

[18] **Q.** You do now acknowledge that MTBE can biodegrade in
[19] groundwater under certain conditions?

[20] **A.** Yes.

[21] **Q.** And with respect to the certain conditions you talked about
[22] in discussing aerobic biodegradation, that aerobic and
[23] anaerobic biodegradation create a chemical called TBA,
[24] tert-butyl alcohol, am I correct?

[25] **A.** Yes.

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Page 1753

Page 1755

[1] terms of totally dealing with the MTBE problem, no, no cleanup
[2] totally dealt with the MTBE problem.

[3] **Q.** Do you have an opinion about why it is so common in the
[4] area around Station 6 to see releases involving MTBE so
[5] inadequately handled?

[6] **MR. STACK:** Objection, your Honor. The question was
[7] asked of this witness numerous times. He calculated lag time,
[8] according to his deposition, and I believe if you look at it
[9] here he never questioned causation or why.

[10] **MR. SHER:** Your Honor, I don't understand the basis
[11] for the objection.

[12] **MR. STACK:** It's beyond of scope of his designation,
[13] beyond the scope of his report and there's a lack of foundation
[14] and it's irrelevant.

[15] **THE COURT:** I think Mr. Stack might be right on all
[16] those points.

[17] **MR. SHER:** I respectfully disagree with him, and, your
[18] Honor, the expert has been proffered as an expert in this
[19] field. He has examined these sites and he is explaining to the
[20] jury why it is that such breakdowns in cleanup are so common,
[21] and he derived those opinions from the files he reviewed.

[22] **THE COURT:** There's a disconnect between what the two
[23] of you are saying that's confusing me. That's what's confusing
[24] me right now. Mr. Stack is saying he was not proffered as a
[25] expert in causation. What you just said had nothing to do with

[1] **MR. STACK:** Thank you, your Honor.

[2] **A.** My answer is fairly general, so I think it's --with what we
[3] just said. In my view, and I would say this more broadly than
[4] Station 6, I would say that many practitioners, including
[5] myself, got used to dealing with gasoline compounds before
[6] MTBE. We have a lot of experience with those and we know what
[7] to do. Just like Dr. Walsh said, we know what to do with those
[8] things. And when MTBE was introduced for a lot of folks, I
[9] mean, there's a time delay between recognizing that look, we
[10] have something brand new to deal with and we have to deal with
[11] it philosophically in the same way, but reaction times need to
[12] be much different. So at least in my view from what I have
[13] reviewed and seen not only here in Station 6 but elsewhere, the
[14] pattern of inadequacy is partly a reflection of what we were
[15] used to doing for many years that was just fine at that time.

[16] **THE COURT:** Well, what's the inadequacy?

[17] **THE WITNESS:** Well, the inadequacy is what we would do
[18] in past years for non-MTBE releases is too slow and not
[19] distributed geographically enough to deal with the MTBE
[20] problem. It is fast enough and geographically distributed
[21] enough to deal with benzene and other types of things like that
[22] that don't travel as fast or as far.

[23] **Q.** So in summary, Mr. Beckett, you found applied environmental
[24] actions --

[25] **THE COURT:** You what?

Page 1754

Page 1756

[1] causation. So there's a disconnect with what the two of you
[2] are saying.

[3] **MR. SHER:** I'm a little at a loss. The expert has
[4] been testifying to the adequacy of steps that were taken at the
[5] sites he reviewed and I'm asking him whether he has an
[6] explanation for why so many of them were inadequate. That's
[7] all.

[8] **MR. STACK:** And in terms of the explanation, your
[9] Honor, I asked him questions at his deposition. He told me all
[10] I did was calculate when the spill report occurred and when the
[11] last cleanup action was undertaken. When I asked him whether
[12] or not he had any opinion as to why that delay occurred, he
[13] told me he had not looked into it.

[14] **THE COURT:** And maybe he's not going to try to explain
[15] why the delay occurred, just that what did occur was adequate
[16] to solve a problem.

[17] **MR. STACK:** And, your Honor, I believe the adequacy
[18] question goes to the causation. Why did this happen, and he
[19] did not form an opinion in that regard.

[20] **THE COURT:** Maybe the adequacy question goes to what's
[21] still there, which is the phase two question, whether and what
[22] is still there. Is that what you're driving at, Mr. Sher?

[23] **MR. SHER:** Yes, your Honor. Yes, it is.

[24] **THE COURT:** That is a phase two question. I'll allow
[25] it because it's directed solely to that.

[1] **Q.** You found the actions that were applied to the site around
[2] Station 6 that you reviewed to be inadequate for MTBE at
[3] virtually all the sites you reviewed?

[4] **MR. STACK:** Objection, your Honor.

[5] **THE COURT:** Sustained. I didn't hear him say that.
[6] You're saying it.

[7] **Q.** I'm sorry. Did you reach a conclusion with respect to the
[8] sites that you reviewed around Station 6 concerning the general
[9] adequacy of actions with respect to MTBE?

[10] **A.** Yes. I think we kind of covered it a little before, is
[11] that in general, with some exceptions, that the
[12] characterization and the remediation actions were inadequate to
[13] protect the groundwater resource from impacts from MTBE.

[14] **THE COURT:** Inadequate again in what sense?

[15] **THE WITNESS:** Inadequate that MTBE impacts are
[16] widespread throughout the system, inadequate that MTBE plumes
[17] are not delineated and not characterized as downstream and
[18] sometimes a vertical area.

[19] **Q.** And do you have an opinion with respect to the adequacy of
[20] protecting the drinking water resource around Station 6?

[21] **A.** Well, yes, I think that's part and parcel to that
[22] statement. That, in other words, it is because the groundwater
[23] drinking resource has not been protected that I think that
[24] what's been done has been generally inadequate over all.

[25] **Q.** Let's turn, we're only going to discuss three specific

Page 1781

[1] So, when I say remediation could be partially
 [2] effective, it may have had an effect up here, but you can see
 [3] that there is MTBE going right past this well location after
 [4] that clean-up stop. So, did it fix the MTBE problem? In my
 [5] mind, no. So that's all this slide shows. We can go past it
 [6] now.

[7] Q. Let's go to the next slide.

[8] A. This is the one that gets to the question you just asked.
 [9] It's very hard to read these boxes. I apologize. I don't draw
 [10] these figures; I take them from the reports. But in I think
 [11] 2005 -- we will look at the table in just a second -- this
 [12] location was installed here. The bottom-most number, which you
 [13] can't read, so I have annotated, is MTBE, and it's at 857 parts
 [14] per billion.

[15] Q. Remind us what we are looking at on this map. Where is the
 [16] gas station?

[17] A. This is the gas station here.

[18] Q. Where are the tanks?

[19] A. The tanks are here, Parsons, and 84. So this is the area
 [20] we have been looking at in the other maps we just covered. So
 [21] off-site here in the downstream direction we get a location,
 [22] and it has 857 ppb in 2007 of MTBE. So you asked before did I
 [23] think it went off-site. I know it went off-site, and I also
 [24] know that we don't know how much further off-site it is at this
 [25] particular point in time.

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(15) Page 1781 - Page 1784

Page 1783

[1] party.

[2] THE COURT: I see. OK.

[3] MR. SHER: OK. Next slide, Liz. Can you go back to
 [4] the table for 26D?

[5] THE WITNESS: OK. So there are several things
 [6] important about 26D. I know this is hard to go through every
 [7] piece of it, but it's deep, so that's the first thing.

[8] Q. What's the significance of it being deep?

[9] A. It's in the regional groundwater is what I would interpret
 [10] it to be.

[11] Q. And why is that significant?

[12] A. That's at least some of what the city wells would be
 [13] pumping from.

[14] OK. So you can see the record from June of 2005
 [15] forward to September of '07. You can see over here -- by the
 [16] way, this highlighting was done by the consultant, not by
 [17] myself, and I think it signifies the contaminant levels in gray
 [18] are above whatever they call the guidance values, DEC guidance
 [19] values.

[20] So, you can see throughout the period of record that
 [21] MTBE is high at this location -- 28 all the way into the
 [22] 900s -- but the interesting thing to me, and a little bit
 [23] disturbing on this particular site, is we have said time and
 [24] time again that generally Benzene, Toluene and all those other
 [25] things don't go very far. They usually don't. You can't

Page 1782

Page 1784

[1] Q. Let's have the next slide, please.

[2] A. This is the sampling record for that location. It's called
 [3] 26D, like David. I believe D stands for deep. The depth of
 [4] groundwater is 110 feet. That's deep. The depth of
 [5] groundwater on the site we were just looking at was 10 to 20
 [6] feet. 10, this is a well I believe put into the deeper more
 [7] regional aquifer, the one we would be concerned with from a
 [8] city drinking water perspective.

[9] THE COURT: Where is that monitoring well?

[10] THE WITNESS: It was on the preceding map, and I will
 [11] show you again if we can go backwards one. That is this
 [12] location right here.

[13] THE COURT: Do you see the monitoring well?

[14] THE WITNESS: It's difficult to see. That's why I
 [15] highlighted it with the an notation.

[16] THE COURT: So, it's right there though.

[17] THE WITNESS: It's right there, that's correct.

[18] THE COURT: OK. Who put in that monitoring well, do
 [19] you know?

[20] THE WITNESS: From recollection I believe this map was
 [21] generated by the consulting company Kleinfelder, but I would
 [22] have to --

[23] THE COURT: I don't mean the map, but who puts in that
 [24] monitoring well?

[25] THE WITNESS: The consultant for the responsible

[1] assume they don't though. That's part of our job as
 [2] environmental protectors and so forth. And what you see here
 [3] for this sight, Toluene, Ethylbenzene, Xylenes, the BTEX got
 [4] not only off-site but they got down to the groundwater 110 feet
 [5] below ground.

[6] Q. What is the significance of that with respect to MTBE in
 [7] that area?

[8] A. Well, again all that one can say definitively is that we
 [9] don't know what happened to MTBE. It traveled at least this
 [10] far, and my interpretation based on what I have seen here and
 [11] elsewhere, is it traveled further. We just don't know where or
 [12] any of the details because it's not characterized.

[13] Q. Do we know whether the 870 odd parts per billion that was
 [14] reported in 26D that you showed us on the other graphic is the
 [15] highest concentration that is off-site?

[16] A. No.

[17] MR. STACK: Objection. Calls for speculation.

[18] THE COURT: No, it doesn't. That would be reported.
 [19] Is that the highest reported value off the site?

[20] THE WITNESS: This is the highest reported value.
 [21] THE COURT: Where is that number? You said 870?
 [22] THE WITNESS: It is -- 941 I think is the highest in
 [23] this table.

[24] THE COURT: Right. That was June 21, '07.

[25] THE WITNESS: Correct.

Page 1805

[1] Q. Can you go to tab D, please, Plaintiff's 10406? You don't
[2] have that? Okay, we'll move on.

[3] Now, based on your review of these records,
[4] Dr. Beckett, have you reached some conclusions concerning the
[5] adequacy of site investigation and remediation of this site?
[6] A. Yes.

[7] Q. Have you prepared some demonstrative slides to explain to
[8] the jury the basis for your opinions?

[9] A. Yes, I have.

[10] Q. Can you pull up the first one, please? Is this one of the
[11] slides you prepared?

[12] A. It is. I think it's the site map we just looked at a
[13] minute ago. The site map itself is from 1996, but I just
[14] annotated up here that the wells were installed -- remember we
[15] looked at that table in 1994. Just so the dates are square.

[16] At this time in this 1996 record, these wells here had
[17] free product in them, floating gasoline, and we see high levels
[18] of impacts distributed all across the site. You may remember
[19] one of the maps we looked at, we'll look at this again, that
[20] the flow direction for water was in the southeast. This is
[21] sort of north or, I'm sorry, if this is north, then the
[22] photograph shows directly to the south. North is not straight
[23] up in this particular map, so the flow direction is to the
[24] south.

[25] I just annotated this reddish box here to show the

[1] those measurements were taken that there was MTBE already off
[2] site?

[3] A. Yes, I think so.

[4] Q. Go zoom back to the slide, please. Any other conclusions
[5] that you used that you want to describe for the jury on this
[6] slide?

[7] A. Well, nothing other than that you can see that the numbers
[8] are high. They're variable like always, but we have free
[9] product here and here. We have high impacts all around the
[10] site. To me this looks like a large spill. It covers the
[11] whole footprint of the site as best that we can see. In all
[12] likelihood it stems off site as well.

[13] Q. Do you have any information from which you're able to
[14] derive any estimate of the actual size of the spill or the
[15] release, rather?

[16] A. No, I have none.

[17] Q. Do you know whether it was a spill or a leak?

[18] A. Well, we can go back to the spill reports and look at the
[19] various things that might have occurred and were reported, but
[20] again, those are the things that are reported. Whether this
[21] was generated by things that were reported or whether this was
[22] generated by things that perhaps weren't reported, we can't be
[23] positive of that.

[24] Q. Can we have the next slide, please?

[25] A. And we already looked at this, and we can probably go on.

Page 1806

[1] area where we don't know anything about the distribution of the
[2] impacts or contamination at this time.

[3] So 1996 we have spill reports that at least I could
[4] identify from December 1988, '94 and so on. So here in 1996
[5] this is the extent of our understanding and we don't yet
[6] understand what might be downstream of those sites.

[7] Q. Just for clarity, the spill reports listed there are
[8] collected directly behind tab 2, am I right? You reference
[9] them in tab 2?

[10] A. The ones that we started, that's correct.

[11] Q. So those provide a basis for this statement here that there
[12] were spill reports as of that date?

[13] A. That's correct.

[14] Q. Why should we be concerned about the area that you've
[15] colored in purple below, to the south of the station, based on
[16] the information that you have here?

[17] A. Perhaps we can zoom in just to this area for a minute.
[18] Thank you. You could see that at these particular locations,
[19] all three of them are informative. We've got, and it's not
[20] easy to read, I'm going to say that's probably 37200 for MTBE
[21] there, 18,000 there, 3500 there. This area here below us to
[22] the south is downstream. So this tells me that there are high
[23] contaminant impacts on the site and we don't know what's off
[24] site.

[25] Q. More likely than not, do you believe that as of the date

[1] It just shows that as of the first sampling in 1994, the MTBE
[2] impacts were recognized at this level as high as 86,000 parts
[3] per billion.

[4] Q. Next slide, please?

[5] A. This map shows, and we've looked at this previously, again
[6] the groundwater flow direction is going this way to the south.
[7] It shows now that by 2002, early 2002, if my memory is correct,
[8] we do have a few off-site wells located down here to the south
[9] of the service station. At this location we have free product
[10] gasoline found floating in that well, and eventually they'll
[11] actually install a cleanup system off site because there's
[12] enough contamination off site that that was felt to be
[13] necessary and we have high impacts of contaminants off site as
[14] of this time. So we suspected in 1996, based on the map you
[15] just looked at, that there were probably impacts off site and
[16] this map confirms. There are and, again, we don't know how
[17] much further they extend downstream to the south.

[18] Q. Can you enlarge the row of boxes just north of where the
[19] purple area is? All right. Where are MTBE results represented
[20] in these figures?

[21] A. It's the -- I don't know. I'd have to go back to the
[22] report.

[23] Q. Is it based on your analysis this shows contamination of
[24] MTBE along with other contaminants at that site?

[25] MR. STACK: Objection, your Honor. He just said he

August 18, 2009

Page 1821

[1] where spill reports were that I could find starting in 1996
 [2] through 2002. The groundwater flow direction again is here
 [3] sort of to the south and southwest. This is monitor well 1 and
 [4] I've just annotated out here that in the downgradient flow
 [5] direction this site is not delineated as of this time. In
 [6] fact, as of any time within the records I reviewed.

[7] Q. To your knowledge, was the downgradient that is off-site
 [8] the extent of the MTBE plume investigated at any time for this?
 [9] A. Within the records I reviewed, no. Many of my records
 [10] stopped at a certain -- well, all records stop at a certain
 [11] point in time. But I think my understanding is that MTBE fuel
 [12] delivery stopped in 2004, and sort of by that time, anything
 [13] else that happens is well after. It's not after the time
 [14] period of concern, but my focus was primarily prior to that,
 [15] although I did look at things after that. So, in other words,
 [16] this site was not characterized in the data that I reviewed as
 [17] of the times I have.

[18] Q. Let's go to the next slide, please. SVA and air sparging
 [19] applied to this site in August of 2004, is that correct?

[20] A. That's correct.

[21] Q. Next slide, please?

[22] A. This site is again, the monitoring, sampling records for
 [23] MW1. All I really wanted to show you is we could see that the
 [24] MTBE has various values, but in general they are starting to
 [25] get lower from the 31,000, and when the air sparging and soil

Page 1822

[1] vapor extraction system started up, the value for that well is
 [2] non-detect. And at the same time that the MTBE is non-detect,
 [3] you can see that the BTEX values are still high.

[4] Q. What does that signify to you?

[5] A. Well, we talked about a few times that MTBE moves out of
 [6] gasoline faster than other things like BTEX and to me this
 [7] shows us exactly that. Here is the BTEX, it's present still at
 [8] high levels, 10,700 and MTBE is non-detect. It tells me that
 [9] MTBE has already moved through and in all likelihood off site
 [10] by this period of time.

[11] So remediation has started, but this is another good
 [12] example of something started too late to be useful.

[13] Q. Do you have an opinion more likely than not whether MTBE
 [14] from this source at this gas station has moved off site?

[15] A. Yes, given everything I've seen, I believe it has moved off
 [16] site.

[17] Q. We talked about three particular gas stations that you
 [18] investigated of the 23. Can you describe for the jury how
 [19] those three analyses were typical?

[20] A. May I rephrase that slightly? I would say that every site
 [21] is different, just like every patient is different, but there
 [22] are certain patterns that we see. The things that were typical
 [23] or I guess that I saw commonly, was that for any site with high
 [24] MTBE impacts like the few that we just looked at, we don't know
 [25] how far they went, we don't know how deep they went and we

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(25) Page 1821 - Page 1824

TRIAL

Page 1823

[1] don't know when they got there.

[2] Q. By they, you mean MTBE?

[3] A. Yes, MTBE. When it got there. Yes, that's correct. So
 [4] that's similar and then for all the sites, again, with
 [5] significant impacts of MTBE, you saw that remediation was done
 [6] at some sites and had some good locally, but in terms of
 [7] fixing, correcting, corralling, drawing back in site the MTBE,
 [8] there was no case that was effective.

[9] Q. The South Conduit site that we looked at there was some
 [10] off-site vertical delineation. Do you recall that?

[11] A. Yes, I do.

[12] Q. Did you see any other sites -- we also saw some vertical
 [13] delineations on Parsons, right, where we had the one monitoring
 [14] well that was across the street from monitoring well 26D, is
 [15] that right?

[16] A. That's right, yes.

[17] Q. Did you typically find as you looked at the sites that
 [18] there was off-site vertical delineation?

[19] A. Well, off-site vertical delineation happened more rarely
 [20] than commonly in the sites that I reviewed. It was present at
 [21] some sites and you just described two out of the three that we
 [22] looked at where there was at least some vertical delineation.
 [23] In terms of complete vertical delineation, meaning do we really
 [24] know where the bottom is, where's the floor of this, no, I
 [25] didn't see any site that really defined the true bottom of

Page 1824

[1] contamination.

[2] Q. Did you see any sites where the true lateral, that is,
 [3] distance from the source, was delineated?

[4] A. No.

[5] MR. SHER: I have no further questions.

[6] THE COURT: Good timing. We'll take our lunch recess
 [7] now and reconvene at 2:00. The jury is excused.

[8] (Jury excused)

[9] (Luncheon recess)

August 18, 2009

Page 1893

Page 1895

[1] **MR. SHER:** Your Honor, I'd like to proffer Mr. Terry
[2] as an expert in hydrogeology, computer modeling, transport of
[3] MTBE and predicting treatment impacts of contaminants on public
[4] water, including MTBE.

[5] **MR. STACK:** Your Honor, I will not object at this time
[6] and reserve for cross-examination.

[7] **THE COURT:** Okay.

[8] **MR. SHER:** Let's take the slide down.

[9] **Q.** Did you use computer modeling in your work on this case?

[10] **A.** Yes, I did. I used two different models.

[11] **Q.** Let me back up a second. What was your assignment in this
[12] case?

[13] **A.** The assignment in this case was that New York City plans to
[14] build a treatment plant to remove MTBE from water at Station 6,
[15] and so what I was asked to do was to determine how much MTBE is
[16] at Station 6 and what the maximum concentration is likely to be
[17] when it's turned back on, and then how long it's going to last.

[18] **Q.** And did you use the computer model in answering those
[19] questions?

[20] **A.** Yes, I did.

[21] **Q.** And how did you do that?

[22] **A.** I used two different models. I used one we call a
[23] groundwater flow model and that tells us where the groundwater
[24] flows, how fast it moves, things like that. That model was
[25] actually a model that was developed originally by the U.S.

[1] at Station 6 in the future when it's turned on. So we wanted
[2] to know what the peak concentration of MTBE would be at the
[3] wells when they turn on and also how long that contamination
[4] would last.

[5] **Q.** What conclusions did you reach, based on your analysis in
[6] this case?

[7] **A.** From running the models, I concluded that the peak
[8] concentration of MTBE at the Station 6 treatment plant would
[9] reach about 35 parts per billion, and that contamination would
[10] persist at the treatment plant at least three parts per billion
[11] or more until the year 2040.

[12] **Q.** And did you reach a conclusion about what year this peak of
[13] 35 parts per billion would be reached?

[14] **A.** Well, I conducted a modeling analysis to investigate that
[15] question and my model shows it around about the year 2024, give
[16] or take.

[17] **Q.** Now, I'd like to step back and have you explain to the jury
[18] step by step how you reached these conclusions. What was the
[19] first step you took in understanding the future impacts on
[20] Station 6 of MTBE?

[21] **A.** Okay, well, the first thing that you want to know when
[22] you're trying to address a question like this is where is the
[23] water coming from that will be pumped at Station 6. Because
[24] there's an area, a capture zone you've heard about before, an
[25] area underground where water will flow to Station 6 in the

Page 1894

Page 1896

[1] Geological Survey, which has been studying the hydrogeology in
[2] this area for a hundred years or more, and they've put this
[3] model together to describe groundwater flow underneath Queens.
[4] They've used the model to address a lot of different questions,
[5] things about salt water intrusion into the aquifer and the
[6] effects of pumping on the aquifer over time.

[7] We took that model and we adapted it and we used that
[8] model as the flow model in this project.

[9] We also used --

[10] **Q.** With respect to that model, is that a generally accepted
[11] model for evaluating the flow of water in the Queens aquifer?

[12] **A.** Yes. This model was developed by the U.S. Geological
[13] Survey. It's an arm of the federal government and they've peer
[14] reviewed and tested this model, so it's a widely accepted
[15] model.

[16] **Q.** What other form of model did you use in this case?

[17] **A.** The other model we used is called a transport model. That
[18] model really rides on top of the flow model. That model
[19] describes how contaminants move through the groundwater system.
[20] So the flow model is actually describing the flow of
[21] groundwater from place to place and the transport model is sort
[22] of describing on top of that how the contamination moves
[23] through the system.

[24] **Q.** And what did you use these models for in this case?

[25] **A.** Well, in this case we were looking to see what would happen

[1] future when it's turned on, so if there are sources of
[2] contamination in that area, those are the sources that
[3] potentially can affect water quality at Station 6 in the
[4] future. So the first question really is to understand where is
[5] this capture zone for Station 6 so we can look and see what
[6] sources of contamination are present there.

[7] In order to do that analysis, I used the groundwater
[8] flow model and I've put together some slides, some
[9] demonstrative exhibit that shows the results of my effort.

[10] **Q.** How did you develop the capture zone in terms of your
[11] assumptions about when wells would be pumping and which wells?

[12] **A.** Well, I got a schedule of how wells planned to be pumped,
[13] from consultants that are water planners for the City of New
[14] York. So they gave me what was the proposed pumping scenario
[15] for all these wells in the Queens area. I say the Queens area.
[16] We really can't look at Station 6 by itself because there are
[17] other wells near Station 6, and when those wells pump they
[18] affect the water flow direction at the wells near Station 6
[19] also. So rather than looking at just how Station 6 will
[20] operate, you also have to look at how the other wells will
[21] operate.

[22] **Q.** Did you prepare a slide illustrating the time line with
[23] these various assumptions regarding the wells that you modeled?

[24] **A.** Yes, I did.

[25] **Q.** Could you turn to tab 2 in the binder?

In The Matter Of:

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EXXON MOBIL CORPORATION, ET AL*

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Page 1972

[1] jury yet. Bring it up so counsel and the judge can see it.
[2] PL23233.

[3] Your Honor, this is -- I can ask Mr. Terry to explain
[4] it if you prefer.

[5] Mr. Terry do you have tab 5 in front of you?

[6] A. Yes, I do.

[7] Q. Can you explain what this is?

[8] A. Yes. This is a table that was made from a database of
[9] water quality data about samples collected at the Station 6
[10] wells.

[11] MR. SHER: Now, your Honor, the source for this is a
[12] database that the parties have stipulated is in evidence, and
[13] this is an extract from that database.

[14] THE COURT: Then there shouldn't be any objection. Is
[15] there, Mr. Stack?

[16] MR. STACK: There is none, as well as the four is
[17] explained. There are many columns on it.

[18] THE COURT: He will.

[19] Q. This is in evidence. Now bring it up for the jury.

[20] Can you explain what the first column on the left is
[21] in this table, Mr. Terry?

[22] A. Yes. That is labeled sample date, and that is the date
[23] that a sample was collected from the well in question.

[24] Q. So this particular page shows wells 6, 6A and 6B. Do I
[25] have that right?

Page 1973

[1] A. That's right.

[2] Q. If you can flip to the second page of the exhibit.

[3] A. There is 6D.

[4] Q. There is 6D. And then at the bottom, 33.

[5] OK. Let's go back to the first page, please. What is
[6] the second column in this table?

[7] A. Well, the second column is labeled MTBE result value. The
[8] one thing to notice about that column is that there are numbers
[9] in that column, but just because there is a number there
[10] doesn't necessarily mean MTBE was detected.

[11] Q. On this table?

[12] A. Yes. If we look over here on the fourth column there is a
[13] couple of places that says detection, no. So in that case that
[14] minus one stands for less than one. So where you see no there
[15] was no detection, it's a less than, here less than 22, here
[16] less than .22, here less than .5.

[17] MR. STACK: Can I have just a moment? There appears
[18] to be just a different document behind tab 5.

[19] MR. SHER: It is different. 4.

[20] Your Honor, I apologize. We will come back in a
[21] little bit.

[22] THE COURT: You could use the Elmo. Then you can just
[23] keep going.

[24] MR. SHER: Excellent idea.

[25] THE COURT: Especially if you remember how to turn it

Page 1974

[1] on.

[2] MR. SHER: Well, that is a challenge.

[3] THE COURT: Yes. Well, it's not hard. There you go.
[4] That's the exhibit you want. OK, that's it.

[5] Q. OK. So this is a copy of the correct 23233, and,
[6] Mr. Terry, this version of it only includes the confirmed
[7] detections, is that right?

[8] A. That's my understanding, yes, that in this table where it
[9] said "no" in that column, those lines do not appear.

[10] Q. OK. What is the column --

[11] MR. STACK: Your Honor, I would object. The
[12] stipulation that we had was for all of the data, not just the
[13] detections. There are numerous tests that there were no
[14] detections.

[15] THE COURT: Well, you can show that on cross. There
[16] is no problem. You can show that chart with all the nos. But
[17] he wants to go over this one now. That's fine.

[18] MR. SHER: Yes.

[19] Q. What is the third column?

[20] A. That's labeled result units, and it says -- it has a little
[21] symbol ug/L. That means micrograms per liter, or parts per
[22] billion.

[23] Q. And the sample type?

[24] A. It says raw water, so that means it's a water sample
[25] directly from the well. Sometimes water systems collect

Page 1975

[1] samples of water after it's pumped and treated, and that's
[2] water that they are going to deliver to the customers. This is
[3] a raw water sample directly from the well itself.

[4] Q. Now, the last three columns, your Honor, I will represent
[5] that pursuant to the stipulation, the agreement was that any
[6] results shown to the jury would include the sample result code,
[7] the Pirnie sample code and the lab sample code. So, I can have
[8] the witness explain that, but I don't believe it's pertinent to
[9] our discussion.

[10] THE COURT: I would rather skip it, Mr. Stack. Do we
[11] need it?

[12] MR. STACK: I don't believe we need it at this point,
[13] your Honor. Thank you.

[14] Q. Now, with respect to the second page of the document
[15] showing wells 6D and 33, can you explain the significance of
[16] the highlighted number?

[17] A. That highlighted number says 350, so that's 350 parts per
[18] billion, and that was the result of an analysis of a sample
[19] that was collected from well 6D in January of 2003. This was
[20] during a pilot test for purposes of planning for the Station 6
[21] treatment plant.

[22] THE COURT: Was it highlighted because it's the
[23] highest value? Because that's the highest of all the values?

[24] THE WITNESS: It is the highest of all the values,
[25] that's correct.

Page 1976

[1] THE COURT: OK.

[2] Q. And what conclusions, if any, did you draw in terms of your
[3] analysis about MTBE contamination of the Station 6 wells from
[4] the data showing confirmed detects of MTBE in the water?
[5] A. It's clear from reviewing the data that MTBE has impacted
[6] water quality at Station 6. It's been present in all of the
[7] Station 6 wells in the upper glacial aquifer at one time or
[8] another between 2000 and 2007, based on this information.

[9] In addition to that, a high concentration of MTBE was
[10] detected at well 6D, of 350 parts per billion, and then MTBE
[11] was present all the way until 2007 at a slightly lower
[12] concentration, 77 parts per billion at that time, but it's
[13] still present as of the last time the well was sampled. So,
[14] that shows us that MTBE is present in the groundwater in the
[15] vicinity of Station 6.

[16] Q. Were you able to derive any conclusions about the frequency
[17] of detections in the wells from the data that you reviewed with
[18] respect to MTBE at Station 6?

[19] A. Well, MTBE is detected, you know, every time at well 6D and
[20] numerous times at other wells as well, so it's been a prolonged
[21] event at these wells.

[22] Q. Now, other than the Station 6 wells, what other information
[23] did you examine in assessing the impact of MTBE on the Station
[24] 6 wells?

[25] A. Well, on that map that we were showing earlier I had --

[1] A. Those are just identification numbers that we assigned to
[2] different sites. There were a lot of different sites that we
[3] looked at, and so we just assigned numbers so we could identify
[4] and track them.

[5] Q. Can you tell the jury which those three gas stations are?
[6] A. Yes, this S6-010 is a Citgo station, this S6-019 a BP Amoco
[7] station, and this S6-030 is called Atlas. It's a private
[8] independent gasoline station.

[9] Q. What about the two gas stations down in the lower
[10] right-hand corner of the circle?

[11] A. This is a BP Amoco station at 113-40 Merrick Boulevard, and
[12] this is a Mobil station at 113-21 Merrick Boulevard.

[13] Q. And what did you conclude from discovering these sources in
[14] this proximity to Station 6?

[15] A. Well, there is high concentrations of MTBE associated with
[16] each one of these gasoline stations. In addition to that, we
[17] also reviewed information about these wells that are labeled
[18] with the red dot with the X in it. And we just on this map, we
[19] just included well locations where MTBE was detected. There is
[20] actually some additional wells associated with the West Side
[21] Corporation investigation in this area, but these are wells
[22] where MTBE was detected in the groundwater. And at this
[23] particular well location right here, the intermediate well at
[24] that location had a concentration of 370 parts per billion of
[25] MTBE.

Page 1977

[1] MR. SHER: Let's bring up 14844A.

[2] A. I should point out that these circles, they are almost
[3] circles, are radii -- radial distance or a distance away
[4] from Station 6. So that first circle that we are seeing there
[5] where it's white in the middle, that's at a distance of half a
[6] mile from Station 6. So first --

[7] Q. Excuse me. Before you move on, yesterday Mr. Stack showed
[8] us a map with a perfect circle drawn around the Station 6 wells
[9] Why is your area not a perfect circle?

[10] A. Well, this is a distance from any of the Station 6 wells,
[11] so over here, because well 33 is one of the Station 6 wells,
[12] but it's kind of offset to the west a little bit, that's why
[13] the circle kind of bumps out here. And similar, you know, the
[14] wells are oriented this way, so it's not perfectly circular
[15] over here either. This is just a distance from any one of the
[16] Station 6 wells.

[17] MR. SHER: Liz, could you enlarge the white circle.

[18] A. So the next piece of information that we looked at was in
[19] the vicinity of Station 6, and there are three gasoline
[20] stations that are located in close proximity, you know, a few
[21] blocks from Station 6 that have known gasoline discharges and
[22] that have known MTBE releases into the groundwater from those
[23] sites.

[24] Q. What is the S6- three digit numbers? What do those
[25] represent?

[1] Q. Let's back up a second on this. Liz, could you bring up
[2] PL5487? This is tab 6.

[3] Your Honor, this is in evidence, and that has been
[4] referred to with other witnesses.

[5] Mr. Terry, is this one of the documents that you
[6] reviewed in your work on this case?

[7] A. Yes, this is the result of work that was done for the West
[8] Side Corporation investigation. Those red dots with the X in
[9] them that I described to you before was installed as part of
[10] this investigation.

[11] Q. To your understanding was the primary purpose of that
[12] investigation to discover and plot the location of PCE
[13] contamination?

[14] A. That's right. They were mapping the locations where PCE
[15] was present in the aquifer because that's the contaminant
[16] that's of concern at that site.

[17] Q. Have you familiarized yourself with how they went about
[18] determining where to place the wells with respect to that
[19] investigation?

[20] A. Yes.

[21] Q. And how was that?

[22] A. Well, they are investigating in the downstream, the down
[23] gradient direction, the direction that groundwater would flow
[24] from the West Side Corporation site, and they are trying to
[25] learn how far out the PCE contamination extends from the West

Page 1980

Page 1982

[1] Side Corporation site.

[2] Q. We have heard the term nested wells. Were these nested
[3] wells?

[4] A. I think, yes, before I used the term cluster, but it's the
[5] same idea. Instead of just installing a single well to a
[6] single depth, they install more than one well, and then those
[7] different wells are installed at different depths in the
[8] aquifer, and at most of these locations there were three wells
[9] installed at different depths.

[10] Q. And did some of those wells discover MTBE contamination?

[11] A. Yes.

[12] Q. And did they discover -- in the wells that discovered MTBE
[13] contamination, were they discovered at all depths in the
[14] aquifer?

[15] A. They were discovered at different depths in different
[16] wells. What was interesting to me was that that well that I
[17] pointed out before at 370 parts per billion was in the
[18] intermediate depth level, so at that location the shallow well
[19] was either nondetect or very low concentration; but it was a
[20] much higher concentration down at the intermediate depth level.

[21] Q. Can you flip to table 7-1. It's Bates number ending in 47.
[22] Sorry. 547.

THE COURT: It's in the book in tab 6.

MR. SHER: That's right, it's the next page.

MR. STACK: I think we are all on the same page.

[1] Q. Liz, if you will jump to table 3-1, please.

[2] THE COURT: What are the last digits of that Bates
[3] number?

[4] MR. SHER: It's 456 and 457, and it's 457 I want to go
[5] to. And enlarge the lower. There you go.

[6] Q. Mr. Terry, this is the 370 ppb detection that you were
[7] referring to?

[8] A. Yes, that's the value right is there.

[9] Q. Is that the same well from which MTBE was reported in the
[10] other report that we looked at?

[11] A. That's correct, the same well, 15I.

[12] Q. What does the J number mean, if you know, or the J letter
[13] mean with respect to some of the entries there?

[14] A. Well, a J value stands for an estimated value. So
[15] typically the laboratory will have a level they detect down to
[16] following a certain protocol, but usually or often times their
[17] instrumentation can actually see levels that are actually below
[18] that level, so they will report those levels but then they will
[19] indicate to the reader that this is an estimated value below
[20] our official detection limit.

[21] So, the laboratory knows that the compound is there,
[22] and they're giving you an estimate value since it's below what
[23] the protocol says. So, if I am looking at this, it's showing
[24] that there are J values for example at well 14. This could
[25] have been reported as ND, or you can look at these values which

Page 1981

Page 1983

[1] MR. SHER: Yes, except I want to be on that page. OK.

[2] Q. Can you describe what this table shows?

[3] A. Yes, I was just describing some results to you before.
[4] There has actually been two different times that samples were
[5] collected from these wells, and the most recent time, which was
[6] in 2009, at the well I was describing, they detected 370 parts
[7] per billion in that well that I pointed out. This table
[8] summarizes the results from an earlier sampling round in
[9] October of 2008, and at that time this well, number 15, which
[10] is the one I pointed out, had an MTBE concentration of 490
[11] parts per billion.

[12] Q. What is the significance of the NDs immediately above and
[13] below this reported value in this table?

[14] A. Well, ND stands for nondetect, so typically the lab that
[15] the sample is sent to will have some level that they can detect
[16] down to, and if they don't detect the presence of a contaminant
[17] at that level or higher, then they just say nondetect. It's
[18] sort of like a "less than" value.

[19] Q. Let's go to tab 7, PL5488. What is this document?

[20] A. This is the May 2009 report which summarizes the results of
[21] the 2009 sampling I was just describing at West Side
[22] Corporation off-site wells.

[23] Q. And is this one of the documents you also reviewed as part
[24] of your work on the case?

[25] A. Yes, I did.

[1] shows the presence of MTBE but it's just at lower levels than
[2] the detection limit.

[3] Q. And what is the significance in your opinion of the
[4] detection of MTBE at this well 151 in the midrange?

[5] MR. STACK: 15I, you mean?

[6] MR. SHER: Sorry. 15I.

[7] A. Well, the significance of this to me -- and I think on the
[8] previous page to this there is a bunch of values also that are
[9] J values -- is that we were looking for whether MTBE was
[10] present in the vicinity near Station 6. You know, is it in the
[11] groundwater? We know it's in the groundwater at Station 6
[12] because we saw the results for samples from the Station 6
[13] wells. Now we are looking just a little bit farther away from
[14] the Station 6 wells, and there is MTBE in the groundwater there
[15] as well.

[16] Q. Let's turn to tab 8 which is PL14844B. This is the same
[17] map we have been discussing only it's focused on a one mile
[18] radius rather than a half mile radius. Mr. Terry, how did you,
[19] if at all, use the information collected on this map in
[20] developing your opinion?

[21] A. Well, this is the same map we saw before, only now instead
[22] of looking at that half mile area around Station 6 wells, this
[23] shows us a one mile radius that's highlighted in the white area
[24] here.

[25] Q. Why did you consider potential sources that were a mile

Page 1984

[1] away?
[2] A. Well, when Station 6 pumps, its capture zone, as we saw
[3] yesterday, extends out away from the well, and so when it first
[4] turns on the water that's very close to the well field will be
[5] the first water that's pumped at Station 6, but as the Station
[6] 6 wells continue to pump into time, water will be drawn from
[7] further and further away from Station 6 wells.

[8] So, when we looked at the map before and we saw that
[9] there were sources of MTBE contamination, you know, close by,
[10] we saw that there was samples that showed MTBE close by, we
[11] know that when the well field first turns on it will be MTBE
[12] contamination. What we are looking for here is what about
[13] longer, what about after a certain amount of time and water is
[14] being drawn from further away.

[15] So, when we look at this map we can see that there
[16] are, you know, many gasoline discharges located by the red dots
[17] in this one mile radius area. So, not only are there sources
[18] of MTBE very close to the well field but there are also many
[19] sources that are farther away from the well field also.

[20] Q. If we could turn to tab 9, which is plaintiff's 14044C.
[21] It's the same map at a two mile radius.

[22] MR. STACK: If I may, I object only because I don't
[23] know which one of those circles is one mile or two miles. It
[24] wasn't clear to me in terms of the white area or the gray area.

[25] THE COURT: The white air area, the inner circle, it

Page 1985

[1] went from a half mile to a mile. Right? I thought he said
[2] that.

[3] MR. SHER: Well, let's go back and make sure I have
[4] that right. Let's go back to PL14844B.

[5] A. Well, in this diagram the white area is the one mile radius
[6] from Station 6.

[7] Q. So the outer one is how far away?

[8] A. Is a two mile radius.

[9] Q. And now go to 14844C. What does this show?

[10] A. Well, this is a map showing a one mile radius around the
[11] Station 6 wells, and the red dots again indicate reported
[12] gasoline discharge.

[13] Q. This is the two mile radius?

[14] A. Sorry, the two mile. I misspoke, sorry. This is the two
[15] mile radius around the Station 6 wells, and the red dots show
[16] the locations of reported gasoline discharges. And the ones
[17] that are circled in yellow are sites that we included in our
[18] modeling analysis.

[19] But what this showed me was that as we are working out
[20] now even farther away, two miles away from the well field, that
[21] there are even more sources of MTBE contamination located in
[22] that radius.

[23] Q. Do all of the sources or potential sources of MTBE shown on
[24] this map fall within what you concluded would be the ultimate
[25] capture zone for Station 6 over time?

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(5) Page 1984 - Page 1987

TRIAL

Page 1986

[1] A. Not all of them do. The final capture zone I drew
[2] yesterday, which sort of extends south and west of the Station
[3] 6 well field is kind of in this area over here. So, this area
[4] to the north and east is not in that final capture zone of the
[5] Station 6 wells.

[6] Q. But remind us whether under the assumptions you used with
[7] respect to both the pumping of Station 6 and the other wells
[8] that you considered, whether the ultimate capture zone is
[9] achieved immediately upon turning on the wells.

[10] A. Well, as we saw yesterday, initially what happens in the
[11] time line that I modeled was that Station 24 turns on, and it
[12] has a capture zone in this area. When Station 6 first turns on
[13] in 2016 it has a capture zone extending in this area with the
[14] exception of the well 24 area. So what we can see from this
[15] map is if that's all that ever happened, if the dependability
[16] wells never turned on in 2020, that this capture area here has
[17] reported gasoline discharges even in that capture zone.

[18] Then of course after the dependability wells turn on,
[19] then the capture zone sort of shifts around, comes over in this
[20] way. But really in any of those scenarios there are really
[21] sources of MTBE in all different directions. We look at this
[22] map and in 360 degrees around here it's sources, it's just
[23] different sources depending on which pumping scenario is in
[24] play.

[25] Q. Did you consider any other sources of information in

Page 1987

[1] developing your opinions with respect to potential sources of
[2] contamination in the area of Station 6?

[3] A. Yes. The next thing I considered was a report by the New
[4] York State DEC about the presence of MTBE contamination at
[5] places where there are not reported gasoline discharges.

[6] Q. And let's bring up PL987, please.

[7] Your Honor, this is behind tab 10. This is previously
[8] been admitted into evidence.

[9] Can you tell us what this study is and how it was
[10] significant to your analysis?

[11] A. Well, this was a study that was performed on Long Island by
[12] the New York State DEC as part of a project that they did under
[13] the jurisdiction of the U.S. EPA. But what they were doing in
[14] this study was they went out into Nassau and Suffolk County on
[15] Long Island, and they looked at gasoline stations where there
[16] had not been any reported discharge of MTBE, and they conducted
[17] investigations of the groundwater at those places to see if
[18] there MTBE there or not. And what they found was that in many
[19] of those stations, even though there had not been a reported
[20] discharge of MTBE there was still MTBE found in the
[21] groundwater, and sometimes at significant concentrations.

[22] Q. Liz, could you jump to the page that Bates number ending in
[23] 810 and highlight the two bullets up at the top.

[24] The first bullet says MTBE exceeded the NYSDOH
[25] drinking water standard and NYSDEC groundwater standard of

Page 1988

Page 1990

[1] 10ug/L at 24 percent and 53 percent of sites investigated in
[2] Suffolk and Nassau Counties respectively.

[3] What did that mean to you, Mr. Terry?

[4] A. Well, as I said, DEC went out and they sampled these low
[5] locations, so at half of the sites they went to in Nassau and
[6] about a third of the sites in Suffolk County they did find MTBE
[7] in the groundwater in the vicinity of those gasoline stations
[8] at concentrations that exceeded the drinking water standard.

[9] So what they are concluding from this is that even though there
[10] hasn't been a reported discharge of gasoline at many places, it
[11] just maybe hasn't been found. And if you go look for it, they
[12] are finding it at a third to half of the sites, they're finding
[13] MTBE in the groundwater at levels that are of concern.

[14] I think another thing they concluded was that Suffolk
[15] County is somewhat less densely developed than Nassau County,
[16] so as we increase in the density of development, there were
[17] more leaks or more discharges detected in the more densely
[18] developed area.

[19] Q. And is Queens more or less densely populated than Suffolk
[20] County?

[21] A. Yeah, Queens obviously is much more densely developed than
[22] most of Nassau County.

[23] Q. The second bullet on the screen reads MTBE concentrations
[24] exceeded 5,000 ug/L at approximately 11 percent of sites in
[25] Suffolk County and 24 percent of sites in Nassau County.

[1] mind that even though there is a lot of those sites, there is
[2] even more additional sites where there is gasoline stations
[3] that don't have reported discharges.

[4] **MR. STACK:** Objection. Move to strike. It's
[5] speculation on his part, offering opinions about releases for
[6] which there is no data whatsoever.

[7] **THE COURT:** That portion should be stricken.

[8] **MR. SHER:** Your Honor, the point of the study is that
[9] we don't know about these sites.

[10] **THE COURT:** I understand. That portion of his
[11] testimony should be stricken. Objection sustained.

[12] Q. Let's move on to the next slide, and again don't show this
[13] next one to the jury.

[14] Did you attempt to determine the number of reported
[15] underground storage tanks containing gasoline in the vicinity
[16] of Station 6 at which no spills or leaks had been reported to
[17] the DEC?

[18] A. Yes, we looked for sites where there was gasoline
[19] underground storage tanks which were present in the same
[20] database I referred to earlier, that toxics targeting database,
[21] as information about gasoline tank locations.

[22] Q. If you could bring up PL148438, please, and not show it to
[23] the jury yet.

[24] **THE COURT:** Is that one of the tabs?

[25] **MR. SHER:** Sorry, your Honor, it's behind tab 11.

Page 1989

Page 1991

[1] Just to remind folks, ug/L is equivalent to parts per
[2] billion, correct?

[3] A. That's correct.

[4] Q. And the sites that are being discussed in this study were
[5] those sites at which MTBE releases or gasoline releases had
[6] previously been known?

[7] A. That's right. These are the same locations. What they are
[8] saying here is if you look at all the sites, that half of them,
[9] for example, in Nassau County exceeded ten; and 24 percent of
[10] the total, about a quarter of the total, exceeded 5,000, which
[11] is a high MTBE concentration and would typically indicate a
[12] substantial release at a site.

[13] Q. But the sites that they are discussing, are they sites that
[14] had previously reported spills or leaks of gasoline?

[15] A. No there had been no reported discharges at these locations
[16] that were sampled.

[17] Q. And what did these study results tell you in terms of the
[18] work that you were doing in this case?

[19] A. Well, what we were doing in this part of our project was we
[20] knew where the Station 6 capture zone was and we were looking
[21] for whether there were sources of MTBE here, and I showed on
[22] the previous slide that there were places where gasoline
[23] discharges had been reported, and there were places where we
[24] know there is MTBE because groundwater had been sampled. But I
[25] think when looking at this study it is important to keep in

[1] Q. Is this a map that you prepared as part of your work in
[2] this case, Mr. Terry?

[3] A. Yes, or my office prepared.

[4] Q. And on what did you base the data that goes into this map?

[5] A. Well, the toxics targeting database has information about
[6] the locations of registered tanks, and so this map is
[7] representing the locations where there is gasoline storage
[8] tanks but it omits those where there were reported discharges
[9] of gasoline.

[10] Q. And is the geolocator data for this information of the sort
[11] that you routinely and reliably use in the course of your work
[12] in these kinds of investigations?

[13] A. Yes, this information came from that toxics targeting
[14] database, so that included the locational information, which is
[15] the type of information we would typically rely on.

[16] Q. And do you consider it accurate for purposes of your work
[17] in this case?

[18] A. Yes, I do, to the best of my knowledge.

[19] **MR. SHER:** I would like to proffer this exhibit first
[20] as a demonstrative but also in evidence.

[21] **MR. STACK:** I would object simply on the basis we
[22] don't know looking at this map -- toxics targeting reports on
[23] all registered tanks. Some tanks on this map may have been
[24] taken out of service before MTBE was used in gasoline. Some
[25] tanks may be storing diesel, some heating oil.

Page 1996

Page 1998

[1] **THE COURT:** Is this Exhibit tab 12?
[2] **MR. STACK:** Yes, your Honor. The stipulation extends
[3] to documents submitted to government agencies.
[4] **THE COURT:** Well, but I think I remember this one. I
[5] remember we used it already.
[6] **MR. SHER:** It was used in part at least in the
[7] cross-examination of Dr. Fogg.
[8] **THE COURT:** No question, it was.
[9] **MR. STACK:** I did not use it.
[10] **THE COURT:** The reason I remember it, I just remember
[11] Haas and Sosik were familiar names, and it definitely was used.
[12] Does that ring a bell to you?
[13] **MR. STACK:** No.
[14] **THE COURT:** No, I remember this one. So I can't say
[15] whether at the time it was used it was in evidence, but it was
[16] definitely on the screen.
[17] **MR. STACK:** Your Honor, note my objection.
[18] **THE COURT:** Well, I'm not sure --
[19] **MR. STACK:** I do not believe it's in evidence, that's
[20] all I'm saying.
[21] **THE COURT:** Right, I realize that. Are you offering
[22] it in evidence?
[23] **MR. SHER:** I am.
[24] **THE COURT:** What is the basis for being able to offer
[25] it in evidence?

[1] aquifer beneath Queens, the same aquifer being described here.
[2] **MR. SHER:** Liz, could you jump forward to the
[3] conclusions which are on the Bates number ending 1800.
[4] Can we show this to the jury now, your Honor?
[5] **THE COURT:** Yes.
[6] **Q.** Let's go back to the first page so the jury can see that.
[7] And highlight the title.
[8] The title is Characteristics of Gasoline Releases in
[9] the Water Table Aquifer of Long Island. Now let's go forward
[10] to the conclusions.
[11] Mr. Terry, could you read the portions of that that
[12] you think are significant for the jury to understand.
[13] **A.** This is saying, "Generally MTBE plumes are thousands of
[14] feet long"-- on Long Island anyway. "Because of vertical
[15] characterization of the sites, the plumes they studied in this
[16] study were documented to dive into the aquifer as it moves away
[17] from its source." Then it goes on to say conventional
[18] approaches to site characterization that rely on monitor wells
[19] with long screens generally do not delineate the extent of
[20] diving plumes such as these.
[21] **Q.** And what is the significance to you in your opinions of
[22] these conclusions?
[23] **A.** Well, I think the first generality was that generally MTBE
[24] plumes are thousands of feet long. So, we can expect that if
[25] there is an MTBE release at a site, given enough time it will

Page 1997

Page 1999

[1] **Q.** Is this document, A, that you reviewed in connection with
[2] your work in the case?
[3] **A.** Yes, it is.
[4] **Q.** And is it the type of article that you reasonably rely on
[5] in performing analyses of the sort that you performed in this
[6] case?
[7] **A.** Yes, I did rely on this paper.
[8] **THE COURT:** This one you did consider and rely on?
[9] **THE WITNESS:** Yes, I did, your Honor.
[10] **THE COURT:** Well, first of all --
[11] **MR. STACK:** I still object on the grounds it's
[12] hearsay.
[13] **THE COURT:** I know, but the rules permit that for the
[14] expert relying on it, plus I think we already had it, so for
[15] both reasons.
[16] **MR. STACK:** Note my objection.
[17] **THE COURT:** I do. But for both reasons I will allow
[18] it in.
[19] **Q.** And, Mr. Terry, what information did you take from this
[20] article that was of significance to your work in this case?
[21] **A.** Well, this was a summary of studies conducted at several
[22] locations on Long Island where there had been MTBE discharges.
[23] So, EPA went out and investigated these sites to determine how
[24] MTBE behaves, and so it was an important study for me to review
[25] because I wanted to understand the behavior of MTBE in the
[1] form a long plume that extends for thousands of feet down
[2] grading of a release site.
[3] The other conclusion that I reached from this is that
[4] the characterization of the sites has shown that the plumes
[5] dive in the aquifer, so rather than stay near the top of the
[6] water table they tend to get deeper as they move away from the
[7] site, and we call that diving plume behavior.
[8] Then the third thing is that the ways that we
[9] conventionally had gone out to look at gasoline contamination
[10] at various gasoline station sites hasn't always been able to
[11] see that MTBE plume because it dives. Many times it dives
[12] deeper than can be seen by the types of wells that were
[13] typically installed at gasoline stations.
[14] **Q.** Let's go to the next page, please. And in the middle of
[15] the first full paragraph -- there you go.
[16] This statement says, "MTBE was only found after the
[17] municipal water supply wells were impacted. Similarly, at East
[18] Patchogue the contamination was detected only after the private
[19] well was impacted. In both cases the absence of MTBE in
[20] on-site soil and groundwater samples was insufficient for
[21] predicting potential future impacts to off-site receptors."
[22] Was this a statement that you considered significant
[23] in your analyses in this case?
[24] **A.** Yes, I considered this to be a very important aspect of the
[25] study.